

Appl. No. 10/673,640
Amdt. Dated September 14, 2005
Reply to Office Action of March 16, 2005

Attorney Docket No. 81788.0258
Customer No.: 26021

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A semiconductor light emitting diode comprising:
epitaxial growth layers including a first conductive type clad layer, an active layer made of an InGaAlP compound semiconductor on said first conductive type clad layer to generate light, and a second conductive type clad layer formed on said active layer; and

a transparent first conductive type GaP substrate ~~made of GaP with a thickness of equal to or more than 150 µm and having a first surface, said first surface having an area equal to or wider than 0.1 mm²~~ and bonded to a bonding surface of said first conductive type clad layer via no layer or via a bond layer, an area of said bonding surface of said first conductive type clad layer being smaller than said first surface of said substrate to locally expose said first surface or said bond layer.

2. (Original) A semiconductor light emitting diode according to claim 1 wherein said substrate is an approximately rectangular solid at least 350 µm wide and at least 350 µm long.

3. (Currently Amended) A semiconductor light emitting diode according to claim 1 wherein said first conductive type clad layer of said ~~epitaxial epitaxial~~ growth layers is bonded to a central portion of said first surface of said

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substrate to expose an outer circumferential part of said first surface or said bond layer.

4. (Original) A semiconductor light emitting diode according to claim 3 wherein a groove is formed in said epitaxial growth layer to expose part of said first surface or said bond layer at the bottom of said groove.

5. (Original) A semiconductor light emitting diode according to claim 1 wherein the coverage of said epitaxial growth layers relative to said area of said first surface of said substrate is in the range not less than 60% and not more than 90%.

6. (Original) A semiconductor light emitting diode according to claim 1 wherein the coverage of said epitaxial growth layers relative to said area of said first surface of said substrate is in the range not less than 70% and not more than 80%.

7. (Original) A semiconductor light emitting diode according to claim 1 further comprising:

a first electrode formed on a second surface of said substrate to reflect said light from said active layer, said second surface being opposite to said first surface; and

a second electrode formed on said second conductive type clad layer, wherein light is extracted from the side of said second conductive type clad layer.

8. (Currently Amended) A semiconductor light emitting diode comprising:

epitaxial growth layers including a first conductive type clad layer, an active layer made of an InGaAlP compound semiconductor on said first conductive type clad layer to generate light, and a second conductive type clad layer formed on said active layer;

a transparent first conductive type semiconductor substrate ~~with a thickness of equal to or more than 150 μm~~ being transparent to light from said active layer and having a first surface and second surface opposite to each other, said first surface ~~having an area equal to or wider than 0.1 mm² and being~~ bonded to a bonding surface of said first conductive type clad layer via no layer or via a bond layer, an area of said bonding surface of said first conductive type clad layer being smaller than said first surface of said substrate to locally expose said first surface or said bond layer, said light being extracted from the side of said second conductive type clad layer;

a first electrode formed on said second surface of said substrate to reflect said light from said active layer; and

a second electrode formed on said second conductive type clad layer.

9. (Original) A semiconductor light emitting diode according to claim 8 wherein said substrate is an approximately rectangular solid at least 350 μm wide and at least 350 μm long.

10. (Currently Amended) A semiconductor light emitting diode according to claim 8 wherein said first conductive type clad layer of said ~~epitaxial epitaxial~~ growth layers is bonded to a central portion of said first surface of said

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substrate to expose an outer circumferential part of said first surface or said bond layer.

11. (Original) A semiconductor light emitting diode according to claim 10 wherein a groove is formed in the epitaxial growth layer to expose part of said first surface or said bond layer at the bottom of said groove.

12. (Original) A semiconductor light emitting diode according to claim 8 wherein the coverage of said epitaxial growth layers relative to said area of said first surface of said substrate is in the range not less than 60% and not more than 90%.

13. (Original) A semiconductor light emitting diode according to claim 8 wherein the coverage of said epitaxial growth layers relative to said area of said first surface of said substrate is in the range not less than 70% and not more than 80%.

14. (New) A semiconductor light emitting diode according to claim 1, wherein said transparent first conductive type GaP substrate is made of GaP with a thickness of equal to or more than 150 μm .

15. (New) A semiconductor light emitting diode according to claim 1, wherein said first surface has an area equal to or wider than 0.1 mm^2 .

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16. (New) A semiconductor light emitting diode according to claim 8, wherein said transparent first conductive type semiconductor substrate has a thickness of equal to or more than 150 μm ; and
said first surface has an area equal to or wider than 0.1 mm^2 .

17. (New) A semiconductor light emitting diode according to claim 1, wherein an area of said first surface of the GaP substrate is larger than an area of a second surface arranged opposite to said first surface of the GaP substrate.

18. (New) A semiconductor light emitting diode according to claim 8, wherein an area of said first surface of the GaP substrate is larger than an area of said second surface of the GaP substrate.

19. (New) A semiconductor light emitting diode according to claim 1, wherein an area of said active layer is smaller than an area of said GaP substrate.

20. (New) A semiconductor light emitting diode according to claim 8, wherein an area of said active layer is smaller than an area of said GaP substrate.